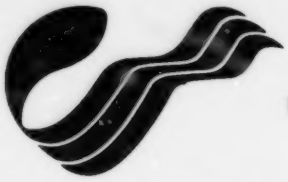


Scientific Excellence • Resource Protection & Conservation • Benefits for Canadians
Excellence scientifique • Protection et conservation des ressources • Bénéfices aux Canadiens

Fisheries Development Division
Fisheries and Habitat Management Branch

Newfoundland
Region

EXPLORATORY CRAB SURVEY

LABRADOR, 1990

PROJECT REPORT FDD 1990 -149

Fisheries and Oceans Pêches et Océans

Canada

91-03823/

DEPARTMENT OF FISHERIES AND OCEANS
FISHERIES AND HABITAT MANAGEMENT BRANCH
FISHERIES DEVELOPMENT DIVISION

EXPLORATORY CRAB SURVEY
LABRADOR
1990

PROJECT REPORT FDD 1990 - 149

BY: Michael Lacey

PROJECT OFFICER: Gerry Brothers

TABLE OF CONTENTS

PAGE

List of Tables iii

List of Figures iv

1. Introduction 1

2. Details of survey area 2

3. Charter vessel and crew 3

4. Fishing Gear and Method of operation

    4.1 Fishing Gear 6
    4.2 Setting Procedure 9
    4.3 Hauling Procedure 9
    4.4 Handling Crab Onboard 12

5. Diuscussion of Results 15

    5.1 Sub Area I 17
    5.2 Sub Area II 21

6. General Comments 24

7. Conclusions 25

8. Acknowledgements 26

LIST OF TABLES

		PAGE
TABLE 1.	SUMMARY OF RESULTS - SUB AREA I	18
TABLE 2.	SUMMARY OF RESULTS - SUB AREA II	22

LIST OF FIGURES

		PAGE
FIGURE 1.	CHARTERED VESSEL M/V PORT ROYAL	5
FIGURE 2.	A CONICAL CRAB POT	7
FIGURE 3.	A SET FLEET OF CRAB POTS	8
FIGURE 4.	SETTING A FLEET OF CRAB POTS	10
FIGURE 5.	HAULING A FLEET OF CRAB POTS	11
FIGURE 6.	HANDLING CRAB ONBOARD	13
FIGURE 7.	HANDLING CRAB ONBOARD (con't)	14
FIGURE 8.	CRAB RESOURCE SURVEY AREA LABRADOR 1990	16

1. INTRODUCTION

The Fisheries Development Division, Fisheries and Habitat Management, carried out an exploratory crab survey from Black Tickle to Cape Harrison, Labrador, in 1989. This survey located substantial quantities of crab. This year, the Fisheries Development Division continued looking for crab by conducting a survey north from Cape Harrison to Nain. This second survey began July 20, 1990 and continued for 26 sea-days, ending on August 14, 1990.

The purpose of the survey was to determine the commercial distribution and abundance of snow crab in areas further north of the existing commercial crab fishery in Labrador.

The survey was undertaken in co-operation with the Science Branch, Department of Fisheries and Oceans, with a view to collecting maximum biological data pertaining to the resource. Except for small samples needed for research, no commercial crab were landed during the survey.

The "Port Royal", a 19.2m (65') commercial crab fishing vessel, was chartered to complete this survey. Descriptions of the vessel, fishing gear and method of operation are provided in this report.

2. DETAILS OF SURVEY AREA

This exploratory survey was carried out between latitude 55 degrees North (off Cape Harrison), to latitude 56 degrees 30 minutes North (off Nain). It covered approximately 7,520 square kilometers (4,700 square nautical miles) from the coastline to approximately 160 kilometers (100 miles) offshore. Fleets of pots were set in depths ranging from 167 meters (91 fathoms) to 404 meters (221 fathoms). The areas surveyed were divided into 47 units each covering 160 square kilometers (100 square nautical miles). One fleet of 35 pots was set in each unit. For the purpose of this report the area has been divided into 2 sub areas. Sub areas are adjoining and will be discussed separately.

3. CHARTER VESSEL AND CREW

The M/V "Port Royal", owned by George Roach, Coley's Point, Newfoundland, was chartered for 26 sea-days to carry out the exploratory crab survey. It is a multi-purpose vessel and is used for commercial crab fishing, gillnetting, purse seining, and longlining.

The overall length of the vessel is 19.2m (65'), with a beam of 5.8m (19'2"). Powered by a 365 BHP Caterpillar diesel engine, it has a cruising speed of 9.0 knots.

The vessel has the following navigational and electronic equipment onboard:

1. Loran C Receivers (2)
   Furuno LC-90 & LC-90 Mark 2
2. Radars (2)
   Decca, Super 101 & Furuno
3. VHF Radio (1)
   Sailor
4. Sideband (1)
   Daniel's
5. Chromascope Coloured Sounder (1)
   Espco
6. Paper Sounder (1)
   Simrad
7. CH-14 Coloured Sounder (1)
8. Autopilot (1)
   Wagner Mk 4
9. Magnetic Compass (1)
10. Mobile Phone (1)
    6L2020
11. CB Radio (1)
12. Watch Alarm System (1)

In addition, the Department of Fisheries and Oceans, Fisheries Development Division, provided a Koden KGP900 GPS System and a Koden LR771 Loran C for the survey.

The crew consisted of Calvin Snow (skipper), Kevin Greenland (cook), John Butt, William A. Morgan, and Alfred Winters (fisherman from Makkovik). The Fisheries Representative onboard was Mike Lacey.

M/V PORT ROYAL

FIGURE 1

4. FISHING GEAR AND METHOD OF OPERATION

4.1 FISHING GEAR

The fishing gear used in this project was the Japanese style conical crab pot (Figure 2) which is typical of those used in the Newfoundland crab fishery. The pot has a frame made from 12.7mm (1/2 inch) iron rods welded together. Each pot has a 1.2m (48 inch) diameter at the base and tapers to a 0.7m (28 inch) diameter top.

The frame of the pot is covered by 130mm (5 1/8 inch) stretch-mesh polyethylene webbing with a plastic cone at the top which allows crab to enter but is funnel shaped to prevent their escape. The webbing at the base of the pot is held together by a drawstring attached to a rubber band and hook which can be easily released to deposit the catch on the deck of the vessel. Each pot weighs approximately 9.1 kg (20 lbs) and is cone-shaped so they may be stacked using a minimum of space.

For the purpose of this survey, each fleet of gear consisted of 35 pots (Figure 3). This was considered sufficient to determine the crab resource of a particular area. The buoyline and groundline of each fleet was made of 16mm (5/8 inch) diameter polypropylene rope while the crab pot bridles and support ropes were made of 12.7mm (1/2 inch) diameter polypropylene rope. A lead rope was attached to the buoyline 18.3-27.4m (10-15 fathoms) from the buoy to prevent excess rope from floating to the surface. Each pot was tied to the groundline at 54.9m (30 fathom) intervals.

A CONICAL CRAB TRAP

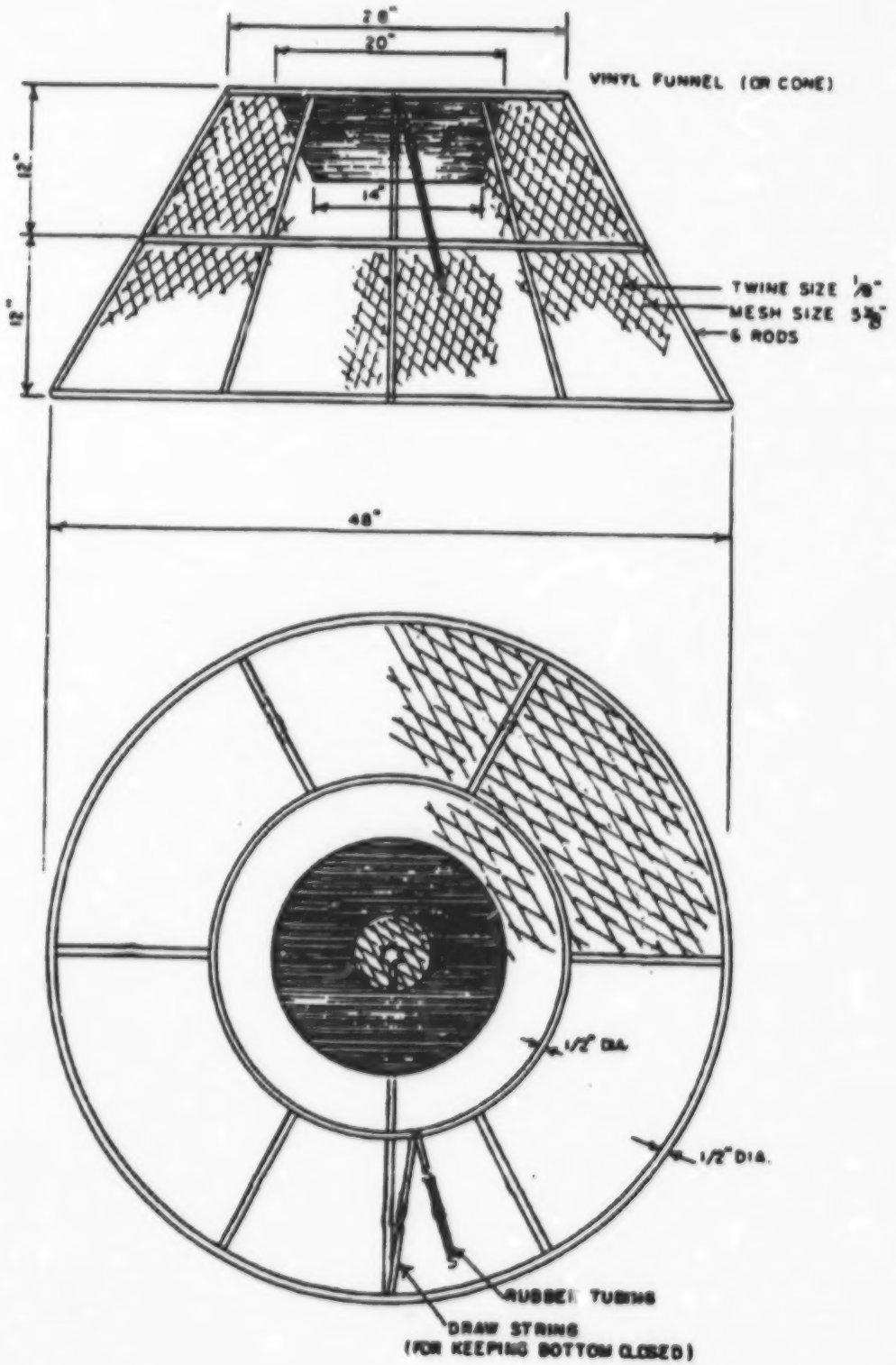


FIGURE 2

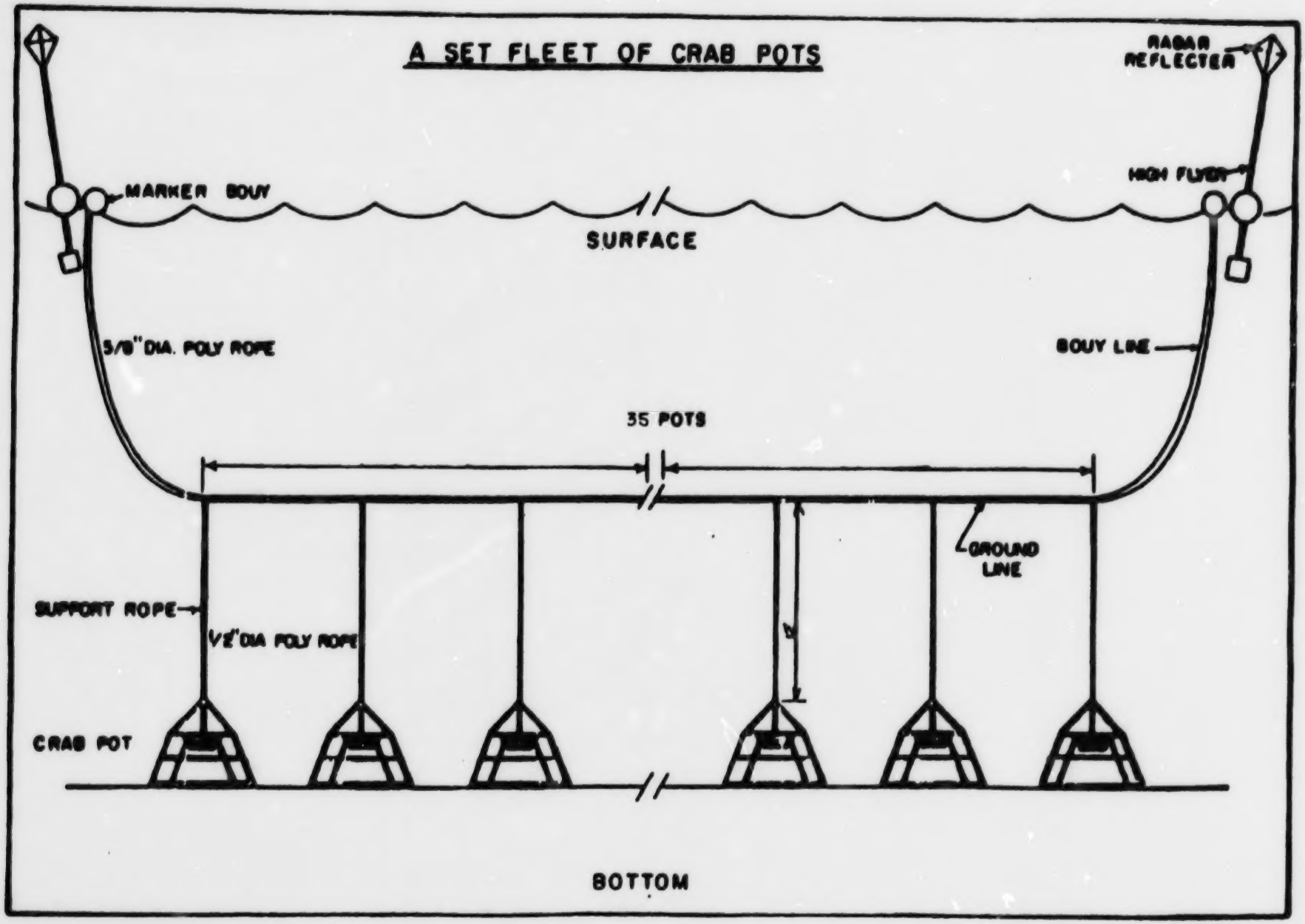

A SET FLEET OF CRAB POTS
RADAR REFLECTER
HIGH FLYER
MARKER BOUY
SURFACE
3/8" DIA. POLY ROPE
BOUY LINE
35 POTS
GROUND LINE
SUPPORT ROPE
1/2" DIA POLY ROPE
CRAB POT
BOTTOM

FIGURE 3

4.2 SETTING PROCEDURE

First a sufficient amount of rope was attached for a buoyline. The buoyline was usually 36.6-54.9m (20-30 fathoms) longer than the depth of the water to allow for tide, wind and depth changes.

The pots were baited by impaling 1 mackerel plus 4 to 5 squid on a wire suspended from the cone of the pot. The process of baiting the pots is completed during the setting procedure.

With the vessel moving at 1/2 speed, the hi-flier (radar reflector) and the inflatable buoy were thrown over the side. a crewman removes a pot from the stack, closes the bottom, secures the purse line and passes the pot to the baiter, who positions the bait in the pot. The baiter then passes the pot to the launcher, who throws it over the side as the main line pulls taut. They continue to set in this way until the end of the fleet is reached. The second buoyline was set out followed by an inflatable buoy.

The positions of the high-flier and inflatible buoy, the water depth and other pertinent information were recorded as each fleet was being set.

Setting a fleet of 35 conical crab pots took approximately 12 minutes from start to finish.

4.3 HAULING PROCEDURE

A fleet of crab pots was hauled between 26 and 138 hours after setting. The average amount of time that a fleet fished was 69 hours. Traps were hauled by means of a standard crab pot hauler.

The skipper operated the boat and hydraulics from the aft pilotage station , while a second crewmember coiled the incoming line. As the first pot came to the rail, it was lifted aboard and while the next pot was being hauled, the drawstring on the first pot was released and the catch deposited in crab boxes on the deck. Then the pot is moved aft to the baiter who removes any old bait. It is then taken by the stacker, upended with the bottom open and stacked 35 pots high (one fleet). This procedure is fairly standard on all commercial crab fishing vessels. The hauling procedure for hauling a fleet of 35 standard crab pots takes about 40 minutes.

SETTING A FLEET OF CRAB POTS

FIGURE 4

HAULING A FLEET OF CRAB POTS

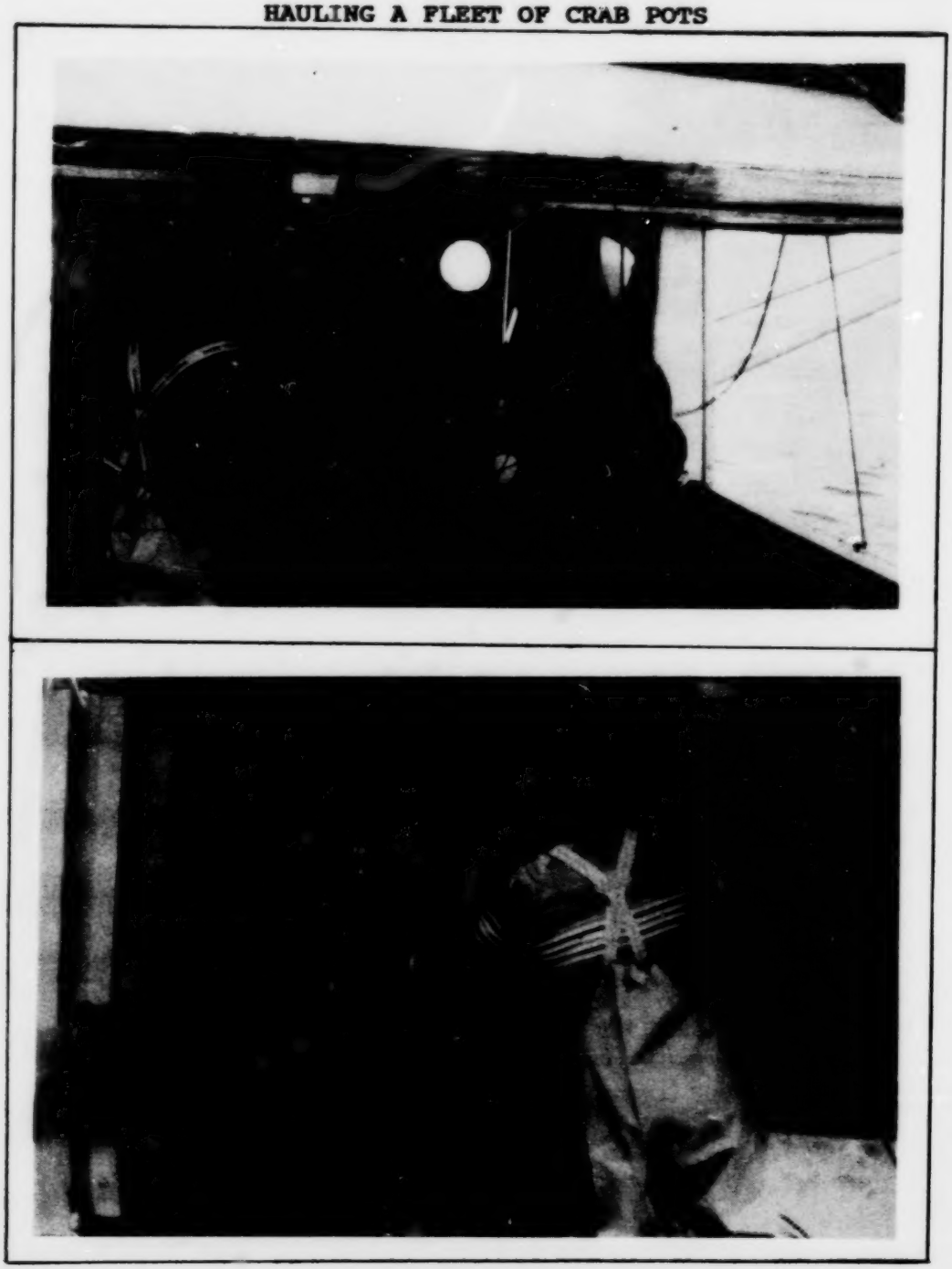


FIGURE 5

4.4 HANDLING CRAB ONBOARD

Once the first crab pot came onboard, any catch of crab was deposited into a crab box along with a tag numbered with the corresponding pot number (1 to 35). The catch was then placed on the stern of the boat, out of the way, until the fleet was hauled.

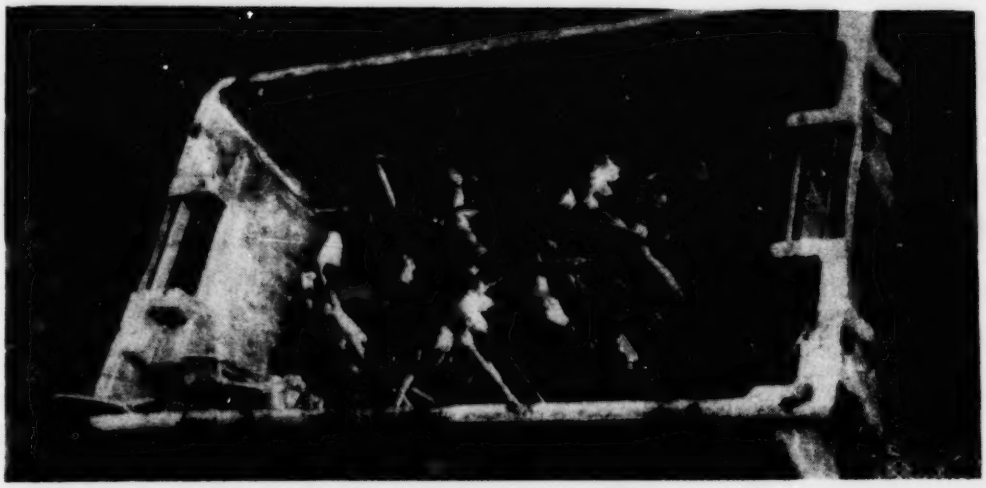
While steaming to the next fleet of gear, the crab in pots numbered 5, 10, 15, 20, 25, and 30 were measured, weighed and shell condition determined. In the remaining pots, the crab were weighed and shell condition was determined. The crab were then separated into four categories:

(1) Commercial Size - Soft Shell
(2) Non-commercial Size - Soft Shell
(3) Commercial Size - Hard Shell
(4) Non-commercial Size - Hard Shell

A commercial size crab is 95 mm (3 3/4") or larger across the widest part of the carapace.

After the measurements and shell conditions were completed, the number of commercial and non-commercial crab were recorded separately and weights of crab from each of the four categories mentioned above were recorded. The crab were then returned to the sea.

HANDLING CRAB ONBOARD



The catch was deposited in boxes, placed on the stern of the boat, out of the way, until the fleet was hauled.

FIGURE 6

HANDLING CRAB ONBOARD CONT'D

WEIGHING CRAB

MEASURING CRAB

FIGURE 7

5. DISCUSSION OF RESULTS

This project was carried out between July 20 and August 14, 1990 and was divided into three trips, with each trip lasting between 4 and 11 days, depending on weather conditions.

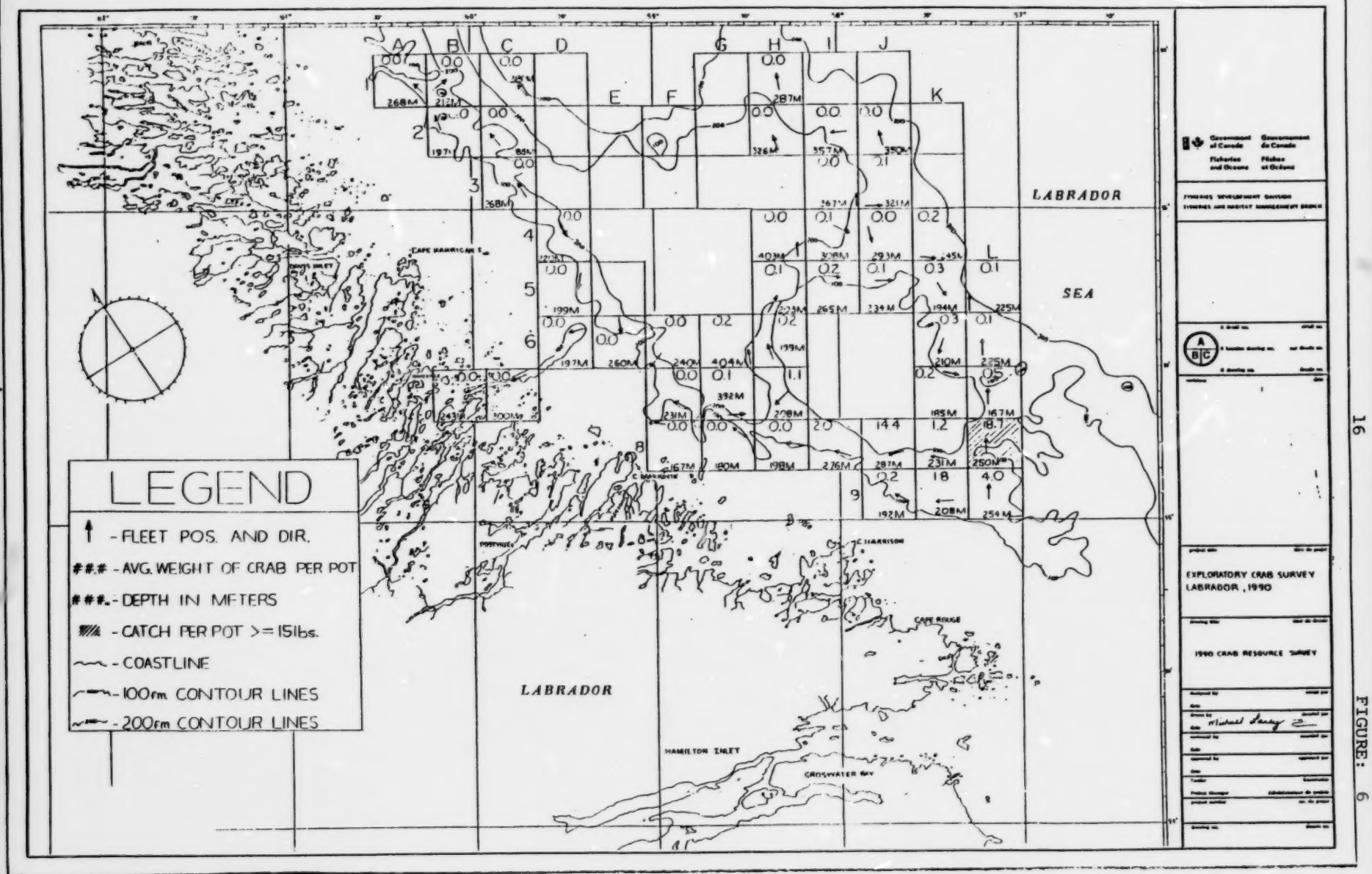
The area surveyed (Figure 8) was north of Cape Harrison, around the Makkovik Bank, along the coast between Makkovik and Nain, and extended approximately 160 km (100 miles) offshore.

The parts of this area which contained water depths in which crab are usually found were divided into 160 square kilometer (100 square nautical mile) units for a total of 9,760 square kilometers (6100 square nautical miles). This grid was then designed with letters horizontally and numbers vertically for easy identification of each unit (Figure 8). One fleet of gear containing 35 crab pots was fished in each unit surveyed.

The area chart (Figure 8) shows the position of each unit. Each fleet of gear that was set is represented on the chart by an arrow showing the direction and position of the fleet. The average catch in pounds and the depth in meters are also shown. Any unit with over 6.8 kg (15 lbs.) of legal size crab per pot was considered to have commercial potential.

In areas where a fair sign of crab was found, 2 pots on each end of a fleet were not considered in calculating the results. These pots on the ends generally do not fish properly (tipped over, tangled, etc.).

The survey area was divided into 2 adjoining sub-areas which, for the purpose of this report, will be discussed separately.


LEGEND
- FLEET POS. AND DIR.
##.# - AVG. WEIGHT OF CRAB PER POT
###.- DEPTH IN METERS
- CATCH PER POT >= 151bs.
- COASTLINE
- 100fm CONTOUR LINES
- 200fm CONTOUR LINES
LABRADOR
SEA
LABRADOR
CAPE HARRICANA
C. HARRISON
CAPE ROUGE
HAMILTON INLET
GROSWATER BAY
EXPLORATORY CRAB SURVEY
LABRADOR, 1990
1990 CRAB RESOURCE SURVEY

16

FIGURE: 6

5.1 SUB AREA I

This sub area is situated within the co-ordinates 55 degrees 50 minutes North, 57 degrees West and 55 degrees 50 minutes North, 60 degrees 15 minutes West to the south and 55 degrees North, 57 degrees West and 55 degrees North, 60 degrees 15 minutes West to the north. Located within this area are 31 units, each covering 160 square kilometers (100 square nautical miles).

During the survey, a fleet of 35 conical crab pots was set in 30 of the 31 units covered by this area. The fleets were set in depths ranging from 167 to 404 m (91 to 221 fathoms). The amount of time each fleet was fishing varied from 30 to 138 hours, with an average of 77 hours.

The type of bait used was mackerel and squid with 1 mackerel and 4 to 5 squid per pot. Catch rates varied from 0.0 to 18.7 lbs. for an average catch of commercial crab per pot. The catch rates were extremely low in most areas, and there was absolutely no sign of crab in the units closest to the coastline.

Only two units produced a good sign of crab, while 10 units did not catch any crab. The remaining 18 units in this area did show a little crab, however catch rates were very low. This could be attributed to the fact that there were large quantities of bait-eating sea lice in many units and the water was very dirty in most areas.

The areas that did produce a little sign of crab were along the southern edge of the Makkovik bank. There was no sign of crab within 30 miles from the coastline. Results indicate that there is no potential for a commercial crab fishery in this area.

TABLE 1 - SUMMARY OF RESULTS - SUB AREA I

UNIT NO.	POSITION	NO. OF POTS	DATE HAULED	FISHING TIME (HOURS)	DEPTH (MTRS)	CATCH (lbs)		
						UNDER SIZE	COMM.	AVG. COMM.
L-9	55 06'.10"N 57 08'.87"W	31	AUG.4	44	254	27	123	4.0
L-8	55 14'.18"N 57 09'.08"W	31	AUG.4	44	250	33	581	18.7
L-7	55 24'.27"N 57 09'.91"W	35	AUG.4	45	167	3	17	0.5
L-6	55 33'.73"N 57 13'.12"W	35	AUG.4	45	225	2	3	0.1
L-5	55 40'.15"N 57 15'.28"W	35	AUG.4	46	225	2	3	0.1
K-9	55 00'.15"N 57 24'.37"W	35	JULY 28	110	208	5	63	1.8
K-8	55 13'.40"N 57 27'.56"W	35	AUG.2	90	231	9	41	1.2
K-7	55 28'.50"N 57 21'.99"W	35	AUG.2	90	185	5	7	0.2
K-6	55 36'.99"N 57 24'.05"W	35	AUG.2	89	210	3	9	0.3
K-5	55 45'.94"N 57 28'.43"W	35	AUG.1	82	194	1	10	0.3
J-9	55 03'.03"N 57 39'.90"W	35	JULY 28	111	192	2.5	6	0.2
J-8	55 12'.15"N 57 45'.34"W	31	JULY 28	111	287	36	446	14.4

TABLE 1 (cont'd) - SUMMARY OF RESULTS - SUB AREA I

UNIT NO.	POSITION	NO. OF POTS	DATE HAULED	FISHING TIME (HOURS)	DEPTH (MTRS)	CATCH (lbs)		
						UNDER SIZE	COMM.	AVG. COMM.
J-5	55 47'.72"N 57 47'.88"W	35	AUG.1	83	234	15	3	0.1
I-8	55 13'.64"N 57 57'.23"W	35	JULY 28	112	276	8.5	69	2.0
I-5	55 47'.15"N 58 05.'42"W	35	AUG.1	77	265	13	6	0.2
H-8	55 14'.50"N 58 14'.50"W	35	JULY 28	113	198	1.5	1	0.0
H-7	55 28'.19"N 58 17'.54"W	31	JULY 29	138	208	13.5	35	1.1
H-6	55 31'.41"N 58 22'.63"W	35	JULY 31	64	199	4.5	8	0.2
H-5	55 41'.40"N 58 20'.08"W	35	AUG.1	76	203	2.5	4	0.1
G-8	55 18'.19"N 58 33'.30"W	35	JULY 28	106	180	1	0	0.0
G-7	55 22'.65"N 58 31'.82"W	34	JULY 29	135	392	0	2	0.1
G-6	55 31'.96"N 58 29'.68"W	35	AUG.1	52	404	2	8	0.2
F-8	55 20'.12"N 58 57'.77"W	35	JULY 28	107	167	0	0	0.0
F-7	55 21'.76"N 58 50'.19"W	35	JULY 28	107	231	0	0	0.0

TABLE 1 (cont'd) - SUMMARY OF RESULTS - SUB AREA I

						CATCH (lbs)		
UNIT NO.	POSITION	NO. OF POTS	DATE HAULED	FISHING TIME (HOURS)	DEPTH (MTRS)	UNDER SIZE	COMM.	AVG. COMM.
F-6	55 30'.01"N 59 04'.02"W	35	AUG.1	45	240	0	0	0.0
E-6	55 37'.14"N 59 16'.25"W	35	AUG.7	46	260	0	0	0.0
D-6	55 35'.42"N 59 26'.20"W	35	AUG.6	37	197	0	0	0.0
D-5	55 45'.41"W 59 26'.80"W	35	AUG.7	49	199	0	0	0.0
C-7	55 27'.19"N 59 47'.98"W	35	AUG.6	32	300	0	0	0.0
B-7	55 25'.62"N 60 00'.08"W	35	AUG.6	30	243	1	0	0.0

5.2 SUB-AREA II

This sub-area is located within the coordinates 55 degrees 50 minutes North, 57 degrees 18 minutes West and 55 degrees 50 minutes North, 60 degrees 32 minutes West to the north and 56 degrees 30 minutes North, 57 degrees 18 minutes West and 56 degrees 30 minutes North, 60 degrees 32 minutes West to the south. This area has been divided into 30 units, however, only 17 units were fished during this survey, covering an area of 2720 kilometers (1700 nautical miles). The remaining units were not fished because there was very little chance of catching any crab, since the pots fished nearby had no crab catches. Those units were also 55 kilometers (34 nautical miles) or more offshore.

During the survey time, 17 fleets of crab pots were set in the units in depths ranging from 197 to 403 meters. The amount of time each fleet was fishing varied from 22 to 114 hours with an average of 58 hours per fleet.

The types of bait used was mackerel and squid with 1 mackerel and 4-5 squid per pot. Catch rates varied from 0.0 to 0.2 lbs. for an average pot. These low catch rates were experienced in all units in this sub-area. The potential for a viable crab fishery does not exist in this area.

TABLE 2 - SUMMARY OF RESULTS - SUB AREA II

UNIT NO.	POSITION	NO. OF POTS	DATE HAULED	FISHING TIME (HOURS)	DEPTH (MTRS)	CATCH (lbs)		
						UNDER SIZE	COMM.	AVG. COMM.
K-4	55 52'.19'N 57 33'.00"W	35	AUG.4	44	245	2	7	0.2
J-4	55 53'.74"N 57 48'.47"W	35	AUG.2	26	293	0.5	1	0.0
J-3	56 00'.89"N 57 48'.74"W	35	AUG.3	42	321	0.5	5	0.1
J-2	56 15'.48"N 57 45'.80"W	35	AUG.8	111	350	0	0	0.0
I-4	55 52'.85"N 57 54'.85"W	35	AUG.3	41	308	0.5	3	0.1
I-3	56 00'.45"N 57 54'.79"W	35	AUG.3	42	367	0	0	0.0
I-2	56 17'.45"N 58 03'.44"W	35	AUG.8	112	357	0	0	0.0
H-4	55 50'.16"N 58 12'.50"W	31	AUG.3	40	403	0.5	0	0.0
H-2	56 18'.74"N 58 16'.68"W	35	AUG.8	113	326	0	0	0.0
H-1	56 25'.14"N 58 22'.43"N	30	AUG.8	114	287	0	0	0.0
D-4	59 34'.82"N 55 54'.76"W	35	AUG.7	53	220	0	0	0.0
C-3	56 02'.49"N 59 43'.07"W	35	AUG.8	29	268	0	0	0.0

TABLE 2 (cont'd) - SUMMARY OF RESULTS - SUB AREA II

						CATCH (lbs)		
UNIT NO.	POSITION	NO. OF POTS	DATE HAULED	FISHING TIME (HOURS)	DEPTH (MTRS)	UNDER SIZE	COMM.	AVG. COMM.
C-2	56 11'.75"N 59 57'.28"W	32	AUG.9	36	285	0	0	0.0
C-1	56 25'.91"N 59 45'.44"W	30	AUG.8	22	380	0	0	0.0
B-2	56 17'.57"N 60 11'.38"W	35	AUG.8	32	197	0	0	0.0
B-1	56 24'.39"N 60 12'.18"W	35	AUG.8	27	212	0	0	0.0
A-1	56 24'.53"N 60 20'.19"W	35	AUG.8	29	268	0	0	0.0

6. GENERAL COMMENTS

Initially, plans were made to survey 61 units in the areas previously discussed. However, only 47 were surveyed. The other 14 units were left undone for a combination of reasons. First, and most important, is that adjacent units produced no sign of snow crab. Hence, it is highly unlikely that these areas would uncover crab. Secondly, the charts used for the survey contained inaccurate depth reading, making it very hard to find suitable depths to fish for the crab. Thus, the remaining 14 units were left unsurveyed.

In an attempt to locate crab during the survey, a number of different depths and bottom types were explored. Despite this, there were still very poor catches of crab. However, several observations were made:

(1) The deeper the water, the greater the abundance of sea lice, wolf-fish and other by-catches.

(2) On hard bottom, the majority of the catch consisted of rock crab.

(3) The deeper the water, the dirtier it was.

The majority of the catch, in most areas, was rock crab. Also, there were good signs of turbot in many of the units surveyed.

7. CONCLUSIONS

The results of this survey has shown that there is only a small population of unexploited Snow crab extending north of Cape Harrison. This crab is located in areas between 25 to 100 miles offshore. There is no sign of crab located close to the shoreline. This population of crab is too small to support a commercial crab fishery. In fact, only one unit of the 47 surveyed had commercial potential, while 24 units produced no crab at all, and 15 units had less than 1 lb. of commercial crab per pot. As a consequence, the viability of a commercial Snow crab fishery in the area in question does not look promising.

9. ACKNOWLEDGEMENTS

The Fisheries Development Division would like to express sincere thanks to the following people for their involvement with the crab resource survey:

- Dave Taylor and Paul O'Keefe for their help in planning the survey.

- George Roach, owner of the Port Royal, the commercial fishing vessel chartered to complete the survey.

- Calvin Snow, (skipper of the Port Royal), Kevin Greenland (the cook) and John Butt, William A. Morgan (crew of the Port Royal) and Alfred Winters (fisherman onboard the Port Royal from Makkovik).

- Kate Mitchell, manager of the Torngat plant in Makkovik, who allowed Fisheries Development unlimited use of the plant's facilities.